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## PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

TRANSLATION  
PCTWRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year)

See form PCT/ISA/210

Applicant's or agent's file reference

R. 306138 Maisch/Bo

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/DE2004/002399

International filing date (day/month/year)

28.10.2004

Priority date (day/month/year)

20.12.2003

International Patent Classification (IPC) or both national classification and IPC

G01N21/35, G01N21/03, G01N21/05

Applicant

ROBERT BOSCH GMBH

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP

Authorized officer

Facsimile No.

Telephone No.

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Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. II

Priority

1. ☒ The following document has not yet been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date in the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application

☒ claims Nos. 2-6

because:

☐ the said international application, or the said claims Nos. \_\_\_\_\_  
relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 2, 3  
are so unclear that no meaningful opinion could be formed (*specify*):

See supplemental sheet

☐ the claims, or said claims Nos. \_\_\_\_\_ are so inadequately supported  
by the description that no meaningful opinion could be formed.

☐ no international search report has been established for said claims Nos. \_\_\_\_\_

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

☐ See Supplemental Box for further details.

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Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	10, 11	YES
	Claims	1, 7-9, 12-14	NO
Inventive step (IS)	Claims		YES
	Claims	1, 7-14	NO
Industrial applicability (IA)	Claims	1, 7-14	YES
	Claims		NO
2. Citations and explanations:			
<p>In this opinion, the following search report citations are mentioned; the same numbering will be used throughout the procedure:</p> <p>D1: DE 195 12 126 C1 (HEKATRON GMBH, 79295 SULZBURG, DE) 5 September 1996 (1996-09-05)</p> <p>D2: US-B1-6 469 303 (SUN HONG <i>ET AL.</i>) 22 October 2002 (2002-10-22)</p> <p>D3: US-A-6 067 840 (CHELVAYOHAN <i>ET AL.</i>) 30 May 2000 (2000-05-30)</p> <p>D4: PATENT ABSTRACTS OF JAPAN vol. 2000, no. 01, 31 January 2000 (2000-01-31) &amp; JP 11 271221 A (HORIBA LTD), 5 October 1999 (1999-10-05)</p> <p>D5: DE 202 03 759 U1 (STEINEL GMBH &amp; CO. KGAA) 18 July 2002 (2002-07-18) 10 April 2003 (2003-04-10)</p> <p>D6: DE 203 01 081 U1 (DRAEGER SAFETY AG &amp; CO. KGAA)</p> <p>D7: US 2002/104967 A1 (KOUZNETSOV ANDRIAN) 8 August 2002 (2002-08-08)</p> <p>D8: PATENT ABSTRACTS OF JAPAN vol. 1997, no. 11, 28 November 1997 (1997-11-28) &amp; JP 09 184803 A (HORIBA LTD), 15 July 1997 (1997-07-15)</p> <p>D9: GB-A-2 262 338 (STEPHEN WILLIAM GOOM) 16 June 1993 (1993-06-16)</p> <p>D10: EP-A-0 825 430 (EEV LIMITED) 25 February 1998 (1998-</p>			

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

02-25)

D11: DE 196 45 321 A1 (WIEGLEB, GERHARD, PROF. DR., 58849  
HERRSCHEID, DE) 7 May 1998 (1998-05-07)

D12: W0 2004/010116 A (SENSEAIR AB; MARTIN, HANS, GOERAN,  
EVALD) 29 January 2004 (2004-01-29)

D13: US 2004/188622 A1 (YOKURA HISANORI *ET AL.*) 30  
September 2004

2 **INDEPENDENT CLAIM 1**

2.1 The present application does not meet the  
requirements of PCT Article 33(1) because the  
subject matter of claim 1 is not novel within the  
meaning of PCT Article 33(2).

2.2 Document D1 discloses (the references between  
parentheses relate to said document):  
gas sensor (see figure 6) for measuring at least one  
gas concentration, having a substrate (4),  
an IR radiation source (5) mounted on the substrate;  
an IR detector (7) mounted on the substrate,  
a measurement space (2) for receiving a gas with the  
gas concentration to be measured,  
a shielding device (25), arranged in the measurement  
space between the IR radiation source and the IR  
detector, for shielding a direct transmission of IR  
radiation from the IR radiation source to the IR  
detector along an optical axis, and  
a reflection surface comprising a concavely curved  
first mirror region (10) for receiving the IR  
radiation emitted by the IR radiation source and a  
concavely curved second mirror region (12)  
reflecting the IR radiation towards the IR detector,

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Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

in which the measurement space is formed between the reflection surface and the substrate.

- 2.3 Document D12 (WO2004/010116) also discloses a gas sensor having the features of claim 1, as long as one of sides 30a or 30c of the chamber (20) is regarded as the substrate (see figure 12), and 3h or 60a (see figure 12 and page 21, lines 20-22) is regarded as the shielding device. The measurement space is then formed between the side 30a or 30b and the concave reflection surface 30b.

**3 DEPENDENT CLAIMS 7-14**

- 3.1 Claims 7-14 do not contain any features which, in combination with the features of any claim to which they refer, meet the PCT requirements for novelty and inventive step, see documents D1 (see figure 6, column 9, lines 33-48) and D4 (see figure 1), the relevant text references cited in the search report.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Box III

**CLAIMS 2-6**

- 1.1 The application does not meet the requirements of PCT Article 6 because claim 2 is unclear.
- 1.2 It is not clear what form the two mirror regions have because the word "spherical" suggests a three-dimensional form and "cross section" a two-dimensional form.
- 1.3 Since claims 3-6 are dependent on claim 2 they are not clear either.
- 1.4 Furthermore, claim 3 is not clear by itself because a semicircular area cannot be concave. It is obvious that an attempt is made here to describe that the area is of semicylindrical design (see description, page 5, line 18). In addition, a semi cylindrical area has a semicircular cross section.